

## CLAIMS :

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1. A gas turbine combustor comprising diffusive  
combustion nozzles which inject fuel and air into a  
5 combustion chamber and form a diffusive combustion  
flame, outer and inner walls which form an annular  
premixing flow passage and premixing nozzles which are  
disposed in the premixing flow passage and form a  
premixing combustion flame by injecting premixed gas  
10 formed by premixing fuel and air into the combustion  
chamber, characterized in that

a plurality of the premixing nozzles are arranged  
in the premixing flow passage;

opening portions permitting air to flow in are  
15 provided at the outer wall so that the air flowed into  
the premixing flow passage forms swirling flow with  
respect to the premixing nozzles; and

the opening portions are disposed in  
circumferential direction and are provided one for  
20 every adjacent two premixing nozzles.

2. A gas turbine combustor comprising diffusive  
combustion nozzles which inject fuel and air into a  
combustion chamber and form a diffusive combustion  
25 flame, outer and inner walls which form an annular  
premixing flow passage and premixing nozzles which are  
disposed in the premixing flow passage and form a

premixing combustion flame by injecting premixed gas formed by premixing fuel and air into the combustion chamber, characterized in that

5 a plurality of the premixing nozzles are arranged in the premixing flow passage;

opening portions permitting air to flow in are provided at the outer wall so that the air flowed into the premixing flow passage forms swirling flow with respect to the premixing nozzles; and

10 the opening portions are disposed in circumferential direction and are provided one for every adjacent two premixing nozzles and the rotating directions of the swirling flows for the respective two premixing nozzles are caused to direct opposite  
15 directions each other.

3. A gas turbine combustor comprising:

diffusive combustion nozzles which inject fuel and air into a combustion chamber and form a diffusive  
20 combustion flame;

an inner cylinder arranged outside the diffusive combustion nozzles;

a plurality of premixing nozzles which are arranged outside the inner cylinder in circumferential  
25 direction and form a premixing combustion flame by injecting premixed gas formed by premixing fuel and air into the combustion chamber; and

means for forming respective swirling flows of different rotating direction for the adjacent two premixing nozzles in circumferential direction.

Sub 5 } 4. A gas turbine combustor according to claim 1 or 2,  
a1 } characterized in that each of the opening portions is provided between the adjacent two premixing nozzles at the position in circumferential direction.

10 5. A gas turbine combustor according to claim 1 or 2, characterized in that each of the opening portions is configured in such a manner that the opening width in circumferential direction varies along the axial direction thereof.

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Sub 6 } 6. A gas turbine combustor according to claim 5,  
a1 } characterized in that each of the opening portions is configured in nearly a triangular shape in such a manner either that the opening broadens in the main  
20 air stream direction prior to flowing into the premixer or that the opening decreases in the main air stream direction prior to flowing into the premixer.

7. A gas turbine combustor comprising diffusive  
25 combustion nozzles which inject fuel and air into a combustion chamber and form a diffusive combustion flame, outer and inner walls which form an annular

premixing flow passage and premixing nozzles which are disposed in the premixing flow passage and form a premixing combustion flame by injecting premixed gas formed by premixing fuel and air into the combustion  
5 chamber, characterized in that

a plurality of the premixing nozzles are arranged in the premixing flow passage; and

opening portions permitting air to flow in are provided at the outer wall so that the air flowed into  
10 the premixing flow passage forms swirling flows for the adjacent two premixing nozzles.

8. A gas turbine combustor comprising diffusive combustion nozzles which inject fuel and air into a  
15 combustion chamber and form a diffusive combustion flame, outer and inner walls which form an annular premixing flow passage and premixing nozzles which are disposed in the premixing flow passage and form a premixing combustion flame by injecting premixed gas  
20 formed by premixing fuel and air into the combustion chamber, characterized in that

a plurality of the premixing nozzles are arranged in the premixing flow passage;

opening portions permitting air to flow in into  
25 the premixing flow passage are provided at the outer wall and at positions between adjacent two premixing nozzles in the circumferential direction; and

isolation wall members which are provided respectively at both sides of the adjacent two premixing nozzles in the circumferential direction.

5 9. A gas turbine combustor comprising:

diffusive combustion nozzles which inject fuel and air into a combustion chamber and form a diffusive combustion flame;

10 an inner cylinder arranged outside the diffusive combustion nozzles;

a plurality of premixing nozzles which are arranged outside the inner cylinder in circumferential direction and form a premixing combustion flame by injecting premixed gas formed by premixing fuel and  
15 air into the combustion chamber;

means for forming respective swirling flows of different rotating direction for the adjacent two premixing nozzles in circumferential direction; and

a member which surrounds the adjacent two  
20 premixing nozzles in the circumferential direction along the axial direction thereof.

10. A gas turbine combustor comprising diffusive combustion nozzles which inject fuel and air into a  
25 combustion chamber and form a diffusive combustion flame, outer and inner walls which form an annular premixing flow passage and premixing nozzles which are

disposed in the premixing flow passage and form a premixing combustion flame by injecting premixed gas formed by premixing fuel and air into the combustion chamber, characterized in that

5 a plurality of the premixing nozzles are arranged in the premixing flow passage; and

opening portions permitting air to flow in are provided at the outer wall so that the air flowed into the premixing flow passage forms swirling flows with  
10 respect to the premixing nozzles, thereby, the rotating directions of the swirling flows for the respective two premixing nozzles are caused to direct opposite directions each other.

15 11. A gas turbine combustor comprising diffusive combustion nozzles which inject fuel and air into a combustion chamber and form a diffusive combustion flame, outer and inner walls which form an annular premixing flow passage and premixing nozzles which are  
20 disposed in the premixing flow passage and form a premixing combustion flame by injecting premixed gas formed by premixing fuel and air into the combustion chamber, wherein

a plurality of the premixing nozzles are arranged  
25 in the premixing flow passage;

opening portions permitting air to flow in are provided at the outer wall so that the air flowed into

the premixing flow passage forms swirling flows with respect to the premixing nozzles;

each of the opening portions is configured in nearly a triangular shape in such a manner either that  
5 the opening broadens in the main air stream direction prior to flowing into the premixer or that the opening decreases in the main air stream direction prior to flowing into the premixer; and

the rotating directions of the swirling flows for  
10 the respective two premixing nozzles are caused to direct opposite directions each other.

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12. A gas turbine combustor use premixing device comprising a plurality of premixing nozzles which are  
15 arranged in circumferential direction and form a premixing combustion flame by injecting premixed gas formed by premixing fuel and air into a combustion chamber, characterized in that one air flow inlet for every adjacent two premixing nozzles is provided so  
20 that a swirling flow is formed for the respective adjacent two premixing nozzles in the circumferential direction.

13. A gas turbine combustor use premixing device  
25 comprising a plurality of premixing nozzles which are arranged in circumferential direction and form a premixing combustion flame by injecting premixed gas

formed by premixing fuel and air into a combustion chamber, characterized in that one air flow inlet for every adjacent two premixing nozzles is provided so that swirling flows of which rotating directions are  
5 opposite each other are formed for the respective adjacent two premixing nozzles in the circumferential direction.

14. A gas turbine combustor use premixing device  
10 comprising a plurality of premixing nozzles which are arranged in circumferential direction and form a premixing combustion flame by injecting premixed gas formed by premixing fuel and air into a combustion chamber, characterized in that means is provided which  
15 forms swirling flows of which rotating directions are different each other for the respective adjacent two premixing nozzles in the circumferential direction.

15. A premixing method for a gas turbine combustor  
20 comprising a plurality of premixing nozzles which are arranged in circumferential direction and form a premixing combustion flame by injecting premixed gas formed by premixing fuel and air into a combustion chamber, characterized in that air is flown from air  
25 flow inlets each being provided for every adjacent two premixing nozzles in the circumferential direction, and swirling flows are formed around the respective



adjacent two premixing nozzles.

16. A premixing method for a gas turbine combustor comprising a plurality of premixing nozzles which are  
5 arranged in circumferential direction and form a premixing combustion flame by injecting premixed gas formed by premixing fuel and air into a combustion chamber, characterized in that air is flown from air  
10 flow inlets each being provided for every adjacent two premixing nozzles, and swirling flows of which rotating directions are opposite each other are formed around the respective adjacent two premixing nozzles.

17. A premixing method for a gas turbine combustor  
15 comprising a plurality of premixing nozzles which are arranged in circumferential direction and form a premixing combustion flame by injecting premixed gas formed by premixing fuel and air into a combustion chamber, characterized in that one air flow inlet for  
20 every adjacent two premixing nozzles is provided so that swirling flows of which rotating directions are different each other are formed around the respective adjacent two premixing nozzles in the circumferential direction.